Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE to respond to a collection of information unless it contains a valid OMB control number.

Older the Paperwork Reduction Pactor 1950, no person	s are required to respond to a consection of thorn leading lifes a contains a va
Substitute for form 1449A/PTO	Complete if Known

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

2 of

Complete if Known						
Application Number	10/735,442					
Filing Date	December 12, 2003					
First Named Inventor	Cheng et al.					
Group Art Unit	Unknown					
Examiner Name	Unknown					
Attorney Docket Number	CL2027 US NA					

			U.S. PATENT DOCU	MENTS	
Examiner Initials	Cite No. ¹	Number Kind Code ² (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
0.30		5,656,472	Ausich et al.	08/12/1997	
7		5,545,816	Ausich et al.	08/13/1996	
		5,530,189	Ausich et al.	08/25/1996 "	
		5,530,188	Ausich et al.	06/25/1996	
)		5,429,939	Misawa et al.	07/04/1995	
<u> </u>					
L					

				FOREIG	N PATENT DOCU	MENTS		
F	For	eign Patent De	ocument	Name of Patentee	Date of Publication of	Pages, Columns, Lines,		
Examiner Initials*	terminer Cite	Cited Document MM-DD-YYYY	Where Relevant Passages or Relevant Figures Appear	To				
		<u> </u>						
	ļ							
		+	 					
		+	 					
	 	+	 					
		 	 					

Examiner Signature	Muslin T. Trople	Date Considered	3/27/06

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

¹ Unique citation designation number. 2 See attached Kinds of U.S. Patent Documents. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. Skind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. Applicant is to place a check mark hee if English language Translation is attached.

Approved for use through 10/31/2002. OMB 0851-0031 U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of Information unless it contains a valid OMB co

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

of 2

Complete if Known						
Application Number	10/735,442					
Filing Date	December 12, 2003					
First Named Inventor	Cheng et al.					
Group Art Unit	Unknown					
Examiner Name	Unknown					
Attorney Docket Number	CL2027 US NA					

<i>a</i>			
		OTHER PRIOR ART NON PATENT LITERATURE DOCUMENTS	
Examiner Initials *	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T 2
caa		Armstrong et al., Eubacterla Show Their True Colors: Genetics of Carotenoid Pigment Biosynthesis from Microbes to Plants, J. Bact., Vol. 176, pp. 4795-4802, 1994	
		Armstrong et al., Genetics of Eubacterial Carotenoid Biosynthesis: A Colorful Tale, Annu. Rev. Microbiol., Vol. 51, pp. 629-659, 1997	
		Sandmann, G., Genetic manipulation of carotenoids biosynthesis: strategies, problems and achievements,, Trends in Plant Science, 6: pp. 14-17, 2001	
		Albrecht et al., Metabolic engineering of the terpenoid biosynthetic pathway of Escherichia coli for production of the carotenoids β-carotene and zeaxanthin, Biotechnol. Lett, Vol. 21, 791-795, 1999	
		Kim et al., Metabolic Engineering of the Nonmevalonate Isopentenyl Diphosphate Synthesis Pathway in Escherichia coli Enhances Lycopene Production, Biotech. Bioeng., 72: 408-415, 2001	
		Mathews et al., Metabolic engineering of carotenoid accumulation in Escherichia coli by modulation of the isoprenoid precoursor pool with expression of deoxyxylulose phosphate synthase, Appl. Microbiol. Biotechnol., Vol. 53, pp. 396-400, 2000	
		Harker et al., Expression of prokaryotic 1-deoxy-D-xylulose-5-phosphatases in Escherichia coli increases carotenoid and ubiquinone biosynthesis, FEBS Letter., Vol. 448, pp. 115-119, 1999	
		Kajiwara et al., Expression of an exogenous ispoentenyl diphosphate isomerase gene enhances isoprenoid biosynthesis in Escherichia coli, Biochem. J., Vol. 423: pp. 421-426, 1997	
4		Wang et al., Engineered Isoprenoid Pathway Enhances Astaxanthin Production in Escherichia coli, Biotechnol. Prog., Vol. 62: pp. 235-241, 1999	
		,	

		<u> </u>	
Examiner Signature	Chustia	Z Tourse Date Considered	3/27/06
	000		1 2/-1/

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. 2 Applicant is to place a check mark here if English language Translation is attached.

Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

PATEKT

Sheet

Examiner

Signature

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Complete if Known **Application Number** 10/735,442 Filing Date **DECEMBER 12, 2003** CHENG ET AL. First Named Inventor UNKNOWN Group Art Unit UNKNOWN **Examiner Name CL2027 US NA Attorney Docket Number**

		OTHER PRIOR ART NON PATENT LITERATURE DOCUMENTS	
Examiner Initials *	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	Т2
CIF		FELLERMEIER ET AL., Studies on the nonmevalonate pathway of terpene biosynthesis, Eur. J. Biochem. 268, pp. 6302-6310, 2001	
J		CUNNINGHAM ET AL., Evidence of a Role for LytB in the Nonmevalonate Pathway of Isoprenoid Biosynthesis, Journal of Bacteriology, Oct. 2000, pp. 5841-5848	·
			,
- · · · · · · · · · · · · · · · · · · ·			
· · · · · · · · · · · · · · · · · · ·			

Date

Considered

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. 2 Applicant is to place a check mark here if English language Translation is attached.

PTO/SB/08A (07-05)
Approved for use through 07/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
od of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449 PTO HEND

r .

Sheet

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

FEB 0 9 7006

(Use as many sheets as necessary)

of

Complete if Known						
Application Number	10/735442					
Filing Date	December 12, 2003					
First Named Inventor	QIONG CHENG					
Group Art Unit	1632					
Examiner Name	UNASSIGNED					
Attorney Docket Number	CL2027USNA					

			 	U.S. PATE	NT DOCUMENTS	
Examiner Initials *	Cite No.1		ocument Number - Kind Code ² (If known)	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
001	1	US-	2002/0102690	08-01-2002	CHENG ET AL.	riguies Appear
		UŞ-				
		US -				
		US -				
		US -				
		US-				
		US-	· · · · · · · · · · · · · · · · · · ·			
		US -				
		US-				
		US -	•			
		US -	*			
		US -				
		US -				
		US -				
		US -				
		US-				
		US-				
		US-				
ļ	ļ	US -				
		US -				

	FOREIGN PATENT DOCUMENTS							
Examiner	Cite	Foreign Patent Document	Publication Date	Name of Patentee or	Pages, Columns, Lines, Where			
Initials*	No.1	CountryCode ³ Number ⁴ Kind Code ⁵ (# known)	MM-DD-YYYY	Applicant of Cited Document	Relevant Passages or Relevant Figures Appear	То		
			<u> </u>					

Examiner Signature	Moster L. Tronde	Date Considered	3/27/06

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patient Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patient documents, the indication of the year of the reign of the Emperor must precede the serial number of the patient document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.



PTO/SB/08B (07-05)
Approved for use through 06/30/2006. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE duction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)
Sheet 1 of 1

Complete if Known				
Application Number	10/735442			
Filing Date	December 12, 2003			
First Named Inventor	QIONG CHENG			
Group Art Unit	1632			
Examiner Name	UNASSIGNED			
Attorney Docket Number	CL2027USNA			

	OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS							
Examiner Initials *	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²					
c02. 1		LUAN TAO ET AL., ISOLATION OF CHROMOSOMAL MUTATIONS THAT AFFECT CAROTENOID PRODUCTION IN ESCHERICHIA COLI: MUTATIONS ALTER COPY NUMBER OF COLE1-TYPE PLASMIDS, FEMS MICROBIOLOGY LETTERS, VOL. 243:227-233, 2005, XP004724622						
	2	MANUELA ALBRECHT ET AL., METABOLIC ENGINEERING OF THE TERPENOID BIOSYNTHETIC PATHWAY OF ESCHERICHIA COLI FOR PRODUCTION OF THE CAROTENOIDS BETA-CAROTENE AND ZEAXANTHIN, BIOTECHNOLOGY LETTERS, VOL. 21:791-795, 1999, XP009007299						
	3	SUSUMU KAJIWARA ET AL., EXPRESSION OF AN EXOGENOUS ISOPENTENYL DIPHOSPHATE ISOMERASE GENE ENHANCES ISOPRENOID BIOSYNTHESIS IN ESCHERICHIA COLI, BIOCHEM. J., VOL. 324:421-426, 1997, XP002357865						
	4	GERHARD SANDMANN, CAROTENOID BIOSYNTHESIS AND BIOTECHNOLOGICAL APPLICATION, ARCHIVES OF BIOCHEMISTRY AND BIOPHYSICS, VOL. 385(1):4-12, 2001, XP002357867						
	5	WILLIAM R. FARMER ET AL., IMPROVING LYCOPENE PRODUCTION IN ESCHERICHIA COLI BY ENGINEERING METABOLIC CONTROL, NATURE BIOTECHNOLOGY, VOL. 18:533-537, 2000, XP002269479						
	6	XIAOLAN ZHANG ET AL., OLIGORIBONUCLEASE IS ENCODED BY A HIGHLY CONSERVED GENE IN THE 3'-5' EXONUCLEASE SUPERFAMILY, JOURNAL OF BACTERIOLOGY, VOL. 180(10:2779-2781, 1998, XP002357868						

Examiner Signature	Charles	I Tomal	Date	3/2-101-
Signature	Coverian	7. Vronde	Considered	0/0/106

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.